

39374-P001C2

PATENT



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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: A. Bryan Waters et al.

Serial No.: Not Assigned

Filed: (herewith)

Group Art Unit: 2163

Before the Examiner: Not Assigned

Title: SYSTEM AND METHOD FOR OPTIMIZING MEDICAL DIAGNOSIS
PROCEDURES AND CLAIMS USING A STRUCTURED SEARCH
SPACE

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D. C. 20231

Dear Sir:

Please enter the following preliminary amendment in the above-captioned case.

IN THE SPECIFICATION:

Please delete the paragraph beginning at page 5, line 12.

Please delete the paragraph beginning at page 5, line 16.

Please replace the paragraph beginning at page 5, line 19, with the following rewritten paragraph:

--Figure 4 shows a diagram that represents a tree-like search space that was constructed using the alphanumeric codes shown in figure 3 and using the reference list shown in figure 2 that was created by Phase II of the preferred embodiment.--

Please replace the paragraph beginning at page 5, line 23, with the following rewritten paragraph:

--Figure 5 shows a diagram of Figure 4 with the minimum branch outline.--

IN THE CLAIMS:

Please reinstate the subject matter of claims 1-6 and 8 in application (Serial No. 09/219,048) as amended by amendment mailed on July 26, 2000 and further amended by the preliminary amendment on August 9, 2001, in new claims 29-35, respectively. Further, please reinstate the subject matter of claims 22-28 in application (Serial No. 09/219,048) as amended by amendment mailed on July 26, 2000 and further amended by the preliminary amendment on August 9, 2001, in new claims 39-45, respectively.

1 29. (New) A method of optimizing medical diagnosis, procedures and reimbursement claims
2 using a structured search space, the method comprising:
3 listing a plurality of medical procedures to produce a master procedure list, wherein the
4 master procedure list includes simple procedures and compound procedures which comprise at least
5 two simple procedures;

6 associating a value to each of the plurality of medical procedures;
7 listing medical procedures for a specific medical encounter to produce a list of ordered
8 procedures;
9 building a search tree of all possible combinations of the simple procedures and the
10 compound procedures in the list of ordered procedures; and
11 searching the search tree for the lowest total of values associated with the medical procedures
12 in the list of ordered procedures.

1 30. (New) The method of claim 29, wherein the master procedure list also includes a short
2 description of the represented medical procedure, a long description of the represented medical
3 procedure, and a list of all simple procedures that make up all compound procedures.

1 31. (New) The method of claim 29, wherein the value associated with each of the plurality of
2 medical procedures includes regional costs and fluctuations.

1 32. (New) The method of claim 29, wherein building a search tree includes:
2 matching compound procedures in the master procedure list to a plurality of simple
3 procedures in the list of ordered procedures to produce a matched compound procedure;
4 eliminating the plurality of simple procedures from the ordered procedure list; and
5 adding the matched compound procedure to the ordered procedure list.

1 33. (New) The method of claim 29, wherein the method further includes eliminating duplicates
2 of simple procedures in the list of ordered procedures.

1 34. (New) The method of claim 29, wherein the method is implemented on a palm sized
1 computer.

1 35. (New) The method of claim 29, wherein the listing of the medical procedures is
2 implemented by a medical professional at the medical encounter.

1 36. (New) The method as recited in claim 32, wherein said steps of matching, eliminating and
2 adding are repeated until all combinations of said compound procedures and said simple procedures
3 are identified.

1 37. (New) A method for optimizing medical diagnosis, procedures and reimbursement claims
2 comprising the steps of:

3 listing a plurality of medical procedures to produce a master procedure list, wherein said
4 master procedure list comprises simple procedures and compound procedures, wherein said
5 compound procedures comprise at least two simple procedures;

6 associating a value to each of said plurality of medical procedures;

7 listing medical procedures for a specific medical encounter to produce a list of ordered
8 procedures;

9 building a set of data structures representing all possible combinations of said simple
10 procedures and said compound procedures in said list of ordered procedures; and

11 identifying a combination of procedures in said list of ordered procedures associated with
12 said specific medical encounter based on a combination of procedures with a minimum total of
13 values associated with said medical procedures for said specific medical encounter.

1 38. (New) The method as recited in claim 37, wherein each of said plurality of medical
2 procedures is associated with a code, wherein if more than one combination of procedures in said
3 list of ordered procedures associated with said specific medical encounter has said minimum total
4 of values associated with said medical procedures for said specific medical encounter then a
5 particular combination of said more than one combination of procedures is selected based on a least
6 number of codes.

1 39. (New) A system, comprising:

2 a processor;

3 a memory unit coupled to said processor, wherein said memory unit is operable for
4 storing a computer program operable for optimizing medical diagnosis, procedures and claims,
5 wherein the computer program is operable for performing the following programming steps:

6 listing a plurality of medical procedures to produce a master procedure list,
7 wherein said master procedure list comprises simple procedures and compound procedures, wherein
8 each of said compound procedures comprises at least two simple procedures;

9 associating a value to each of said plurality of medical procedures;

10 listing medical procedures for a specific medical encounter to produce a list
11 of ordered procedures;

12 building a search tree of combinations of simple procedures and compound
13 procedures in said list of ordered procedures; and

14 searching said search tree for a lowest total of values associated with said
15 medical procedures in said list of ordered procedures.

1 40. (New) The system as recited in claim 39, wherein said master procedure list comprises a
2 description for each of said plurality of medical procedures and wherein said master procedure list
3 includes a list of simple procedures that comprise compound procedures for each of said compound
4 procedures in said master procedure list.

1 41. (New) The system as recited in claim 39, wherein said value associated with each of said
2 plurality of medical procedures comprises costs.

1 42. (New) The system as recited in claim 39, wherein said programming step of building a
2 search tree comprises the following programming steps:

3 matching the components of said compound procedures in said master procedure list to a
4 plurality of simple procedures in said list of ordered procedures to produce a matched compound
5 procedure;

6 eliminating said plurality of simple procedures in said list of ordered procedures; and
7 adding said matched compound procedure to said list of ordered procedures.

1 43. (New) The system as recited in claim 39, wherein the computer program is further operable
2 for performing the following programming step:

3 eliminating duplicates of simple procedures in said list of ordered procedures.

1 44. (New) The system as recited in claim 39, wherein said search tree of combinations includes
2 all possible combinations of compound procedures and simple procedures.

1 45. (New) The system as recited in claim 39 further comprising:

2 a touch-sensitive display device coupled to said processor, and wherein the computer
3 program is further operable for performing the following programming step:

4 listing said medical procedures for said specific medical encounter in response to
5 user input on said touch-sensitive display device.

1 46. (New) The system as recited in claim 42, wherein said programming steps of matching,
2 eliminating and adding are repeated until all combinations of said compound procedures and said
3 simple procedures are identified.

1 47. (New) A system, comprising:

2 a memory unit operable for storing a program operable for optimizing medical
3 diagnosis, procedures and claims;

4 a processor coupled to said memory unit, wherein said processor, responsive to

5 said program, comprises:

6 circuitry operable for listing a plurality of medical procedures to produce a
7 master procedure list, wherein said master procedure list comprises simple procedures and
8 compound procedures, wherein said compound procedures comprise at least two simple
9 procedures;

10 circuitry operable for associating a value to each of said plurality of
11 medical procedures;

12 circuitry operable for listing medical procedures for a specific medical
13 encounter to produce a list of ordered procedures;

14 circuitry operable for building a set of data structures representing all
15 possible combinations of said simple procedures and said compound procedures in said list of
16 ordered procedures; and

17 circuitry operable for identifying a combination of procedures in said list
18 of ordered procedures associated with said specific medical encounter based on a combination of
19 procedures with a minimum total of values associated with said medical procedures for said
20 specific medical encounter.

1 48. (New) The system as recited in claim 47, wherein each of said plurality of medical
2 procedures is associated with a code, wherein if more than one combination of procedures in
3 said list of ordered procedures associated with said specific medical encounter has said minimum
4 total of values associated with said medical procedures for said specific medical encounter then a
5 particular combination of said more than one combination of procedures is selected based on a
6 least number of codes.

REMARKS

The Examiner in the Office Action (dated August 27, 2001) rejected the subject matter of the above reinstated claims 29-35 and 39-45 under 35 U.S.C. §103(a) as being unpatentable over Mohlenbrock et al. (U.S. Patent No. 4,667,292) (hereinafter "Mohlenbrock") in view of Gear (*Applications and Algorithms in Science and Engineering*). Applicants respectfully traverse these rejections for at least the reasons set forth below. Furthermore, Applicant respectfully asserts that the newly claimed subject matter of claims 36-38 and 46-48 are patentable over Mohlenbrock in view of Gear for at least the reasons set forth below.

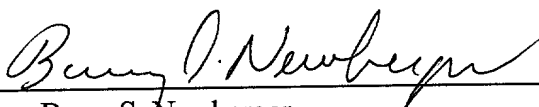
The Examiner states in the Office Action (dated May 30, 2000) that "it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to combine the teachings of Mohlenbrock and Gear to create a method of optimizing medical diagnosis, procedures and claims using a structured search space. Since lists are 'a useful mechanism for maintaining sets of unordered or ordered items that are to be updated by insertions and deletions (Gear, p.A113, lines 23-25), they are beneficial to a medical system that frequently requires updates due to new technologies and advances in medicine. Using trees to search the lists is beneficial because in computer applications they are easy to represent, build, search and update." See Office Action (dated May 30, 2000), Pages 3-4.

A prima facie case of obviousness requires the Examiner to establish, *inter alia*, that the prior art references teach or suggest, either alone or in combination, all of the limitations of the claimed invention, and the Examiner must provide a motivation or suggestion to combine or modify the prior art reference to make the claimed invention. See M.P.E.P. §2142. The motivation or suggestion to combine references must come from one of three possible sources: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art. See *In re Rouffet*, 47 U.S. P.Q.2d 1453, 1458 (Fed. Cir. 1998). Thus, *the Examiner has failed to support*

the proposition that it would have been obvious to modify Mohlenbrock to build a search tree of all possible combinations of the simple and compound procedures in the list of ordered procedures and searching the search tree for the lowest total of values associated with the medical procedures in the list of ordered procedures. The Examiner must provide objective evidence to support this proposition. See In re Kotzab, 217 F.3d 1365,1371, 55 U.S.P.Q.2d 1313, 1316-1317 (Fed. Cir. 2000); M.P.E.P. §2144.02. The necessity of such objective evidence as a predicate to a prima facie showing of obviousness is persuasive in the 35 U.S.C. §103 jurisprudence. In re Lee, 61 U.S.P.Q.2d 1430, 1433 (Fed. Cir. 2002). That is, the Examiner's inquiry into whether to combine references must be based on objective evidence of record and must not be based on hindsight. In re Lee, 61 U.S.P.Q.2d at 1433. Particular findings must be made as to the reason why the skilled artisan with no knowledge of the claimed invention would have selected the teachings for combination in the manner claimed. In re Lee, 61 U.S.P.Q.2d at 1433 (citing In re Kotzab, 217 F.3d at 1365, 55 U.S.P.Q.2d at 1317). As a result, there is nothing to suggest one skilled in the art would be able to recreate, without benefit of the Application, claims 29-48 in view of Mohlenbrock & Gear.

Attached hereto is a marked-up version of the changes made to the specification by the current amendment. The attached page is captioned "**Version with markings to show changes made.**"

Respectfully submitted,
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VERSION WITH MARKINGS TO SHOW CHANGES MADE**In the Specification:**

The paragraph beginning at page 5, line 12, has been deleted.

The paragraph beginning at page 5, line 16, has been deleted.

Please replace the paragraph beginning at page 5, line 19, with the following rewritten paragraph:

Figure 4 [Figure 6] shows a diagram that represents a tree-like search space that was constructed using the alphanumeric codes shown in figure 3 and using the reference list shown in figure 2 that was created by Phase II of the preferred embodiment.

Please replace the paragraph beginning at page 5, line 23, with the following rewritten paragraph:

Figure 5 shows a diagram of Figure 4 with the minimum branch outline. [Figure 7 illustrates the optimum path through the search space shown in figure 4 as illustrated by arrows following the links between nodes in the search space.]